

Sample UBD Unit for Middle School Technology Education Modular Instruction

South Dakota Middle School Technology Education Course Content Standards Covered:

TEMS.1.2 Examine the core relationships between technology and other areas of study
TEMS.3.1 Demonstrate an understanding of the components of design (feedback loop)
TEMS.3.3 Apply the design process
TEMS.4.1 Apply appropriate safety practices
TEMS.4.6 Select and use manufacturing technologies.
TEMS.4.7 Select and use construction technologies.

Technology Education Standard #19

Students will develop an understanding of and be able to select and use manufacturing technologies.

The Addressed Benchmarks for this middle school Manufacturing Backwards Design Unit Include:

- Manufacturing goods
- Manufacturing processes
- Materials use
- Marketing products
- Manufacturing systems

Technology Education Standard #11

Students will develop the abilities to apply the design process

The Addressed Benchmarks for this middle school Manufacturing Backwards Design Unit Include:

- Apply the design process
- Make a product of system

7th grade Manufacturing Unit (4-5 days)

Identify desired results:

Students will demonstrate knowledge of....

- Manufacturing goods
- Manufacturing processes
- Materials use
- Finishing materials
- The Design Process

What will students understand as a result of this unit?

- Students will understand and apply the design process
- Students will understand all of the steps involved in the manufacturing process.
- Students will understand why different materials are used in certain manufacturing processes.
- Students will understand the role of marketing in manufacturing.

What are the overarching “essential” questions?

- Why is the manufacturing process so important?
- How does the manufacturing process affect me? (the student)

What “essential” and “unit” questions will focus this unit?

- What is manufacturing?
- How does design affect the marketability of a product?

What evidence will show that students understand manufacturing?

- Students will take a pre –test that will be compared to a post test upon completion of the module
- Students will create a finished jump peg game using the manufacturing process
- Students will complete two quizzes and a post test.
- Students will describe all of the steps involved in the manufacturing of their game. This will include: selection of materials and why, how materials are formed (tools required), and marketing considerations.
- Vocabulary list showing understanding of manufacturing related terms
- Two short answer questions each day
- Students will complete two safety quizzes over the drill press and the scroll saw

Other Evidence:

- I will be making observations throughout the module and “jumpstarting” their thinking with probing questions in an effort to create metacognition.

Student Self-Assessment:

- Self assess your jump peg game project. (Students will examine their work and compare it to the example, they will note what they would do different if they attempted the project again)
- Self assess your knowledge of the manufacturing process. Ex. What is the manufacturing process and how does it affect you (the student)?
- Self assess your effort with a daily 5 pt grade

Given the targeted understandings, other unit goals, and the assessment evidence identified, what knowledge and skills are needed?

Students will need to know...

- Key terms: Automation Process, CNC machining, Coordinate Pair, Automation, Accuracy, Numerical, Accident, Finish, Consumer, Industry.
- What it means to manufacture a product
- Why applying a finish to a product is necessary
- Why do companies manufacture products that have more than one use

Students will need to be able to...

- Safely use a scroll saw
- Safely use a drill press
- How to use the Cartesian coordinate system

What teaching and learning experiences will equip students to demonstrate the targeted understandings?

1. Students will take safety quizzes over the scroll saw and drill press
2. Students will demonstrate understanding of the scroll saw and drill press by using them during the manufacturing process
3. Students will complete a manufacturing process by manufacturing a Jump Peg game
4. Students will be asked oral and written questions about the manufacturing process and their project.
5. Assess and give feedback on the jump peg game.

Lesson Planner for 5-day Automation Module

(Lesson Planner does not show the 3 minute clean-up at the end of the period)

Day 1	Day 2	Day 3	Day 4	Day 5
Take 10 question Pre-Test	3 question quiz	3 question quiz	Create Coordinate Chart for Tic-Tac-Toe game that will be drilled on the back of the Game Board	Take 10 question Post Test
Drill Press Safety Test	Scroll Saw safety quiz	Finish sanding game board		Finish drilling holes if necessary
X, Y Coordinate Video	Measure and Layout lines for cutting the game board	Apply finish (vegetable oil)	Plan and Layout placement of Tic-Tac-Toe holes	Sand Tic-Tac-Toe side
Material Selection/Begin Drilling Holes	Cut the game board using the scroll saw	Answer Assessment Questions	Drill Holes	Apply finish (vegetable oil)
Answer Assessment questions	Begin Sanding block	Define Vocabulary Words	Answer Assessment Questions	Finish Defining any vocabulary words that are not complete and finish answering and incomplete assessment questions
Define Vocabulary Words	Answer Assessment Questions	Play the jump peg game for the remainder of the period	Define Vocabulary words	Play Tic-Tac-Toe with your partner
	Define Vocabulary Words			